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# Worldwide Report

ENVIRONMENTAL QUALITY

No. 297



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SOUTH ASIA ENVIRONMENTAL MEET OPENS IN COLOMBO

New Delhi PATRIOT in English 24 Feb 81 p 3

[Text] The ten-nation Ministerial-level inaugural meeting of the South Asia Cooperative Environment Programme (SACEP) was declared open by Prime Minister R Premadasa here today with a call for the "integration of environmental concerns with economic goals and policies."

The Prime Minister said, "We should identify to what extent such integration may require changes in existing life-styles and patterns of development. Equally important would be the need to stimulate a continuing effort to adopt environmentally sound projects, programmes and policies."

Union Minister of State for Science and Technology C P N Singh addressing the conference laid stress on promotion of environmental education and training in the region.

Mr Singh also spoke of social forestry being of "grave concern to all our nations in the context of the search for alternate energy sources." India had achieved excellent results in this field.

The three day conference is being attended by eight of the ten countries. Burma and Bhutan are absenting owing to unavoidable reasons. India, Pakistan, Bangladesh, Maldives and Sri Lanka are being represented by their Ministers, Afghanistan by a senior official and Iran and Nepal by their ambassadors.

The task before the SACEP is to formulate project proposals under various subject areas as decided at Bangalore, including environmental management, management of natural resources, education training and desertification.

The ministerial meeting initiating the SACEP follows an inter-Governmental experts group meeting of the ten South Asian countries in Bangalore last March convened by the regional office for Asia and the Pacific of the United Nations Environment Programme.

The Bangalore meeting was of the unanimous opinion that the South Asia sub-region with a diversity of land forms, climates, soils, natural vegetation and human settlements, afforded an unique opportunity for a collaborative approach towards the protection and management of the environment.

EXCESS GROUND WATER SAID TO CAUSE NUTRIENT LOSS

Dacca THE BANGLADESH OBSERVER in English 20 Feb 81 p 3

[Text] Agro-scientists in Dacca are pondering over the serious loss of some plant nutrients of the soil due to excessive use of underground water for irrigation reports BSS.

The loss is more acute in the paddy fields of north-western part of Bangladesh where successful crop production largely depends on ground water.

Preliminary information collected by the Soil Science Division of Bangladesh Agricultural Research Institute (BARI) at Joydevpur indicated that water from some of the tube-wells contained large amounts of dissolved chemical ingredients which not only would damage standing crops but also destroy the total character of the Soil. [as published]

This was stated by the senior scientists of BARI while they were talking to a group of visiting journalists at the institute on Wednesday.

Investigations showed that prolonged water-logging of the paddy fields under tube-well command causes a series of electrochemical changes in the soil which reduce the quantity of plant nutrients such as sulphur and trace elements. [as published]

Quoting the reports of Bangladesh Rice Research Institute (BRRI) Scientific Officer, Soil Physics Section of BARI stated that the loss of zinc and sulphur in the soil of paddy fields was so acute that a substantial quantity of its costly fertilizers were being required to be imported from abroad. [as published]

On analysing the ground-water table of some areas of Rajshahi, Bogra and Rangpur districts the soil scientists of BARI found that the concentration of different bicarbonates in the water was between 150 and 540 milligram per litre whereas the maximum allowable concentration was up to 1.5 milk equivalent per litre.

CSO: 5000

# ENVIRONMENTAL EFFECTS OF WETLANDS EXAMINED

Dacca THE BANGLADESH OBSERVER in English 14, 15 Feb 81

[Article by M. Ismail]

[14 Feb 81, pp 5-6]

[Text] The environment of Bangladesh is critical, delicate and easily vulnerable because of many water-influenced biological behaviours due to the historic abundance of its water from which life emanates. The country is well known for its high annual rainfall of about 100 inches in average. It is practically a semi-aquatic rice-land where most areas are under water during the rains and only partially dry in cold season. Its geographical position in the south slope of the world's highest mountain of Himalayas and along the funnel shaped northern extremity of the Bay of Bengal, its abundance of large rivers and estuaries, remarkably wet monsoon rainy days followed by pronounced dry season and the extensive coastal mangrove forests with many endangered biological species make it ecologically very significant. [as published]

## Recent Geophysical Events and Climate

The theme of the present work centers round the geophysical and physical events of landmass exposure and the solar effect of differential heating and cooling of aquatic and terrestrial environments of influence the movement of wind and cloud that cause rains. The demonstration of this principle in small scale in the laboratory is not difficult. But under natural multiplicity of conditions, particularly in the extensive wetlands of Bangladesh where many large rivers criss-cross its display may face a practical difficulty. However, some incidences of occasional dry and wet seasons low flows of the river water corresponding to high and low incidence of heavy rains respectively, illustrate these principles by showing some abnormal features in the long known rainfall pattern of the region. Under a condition of recent exposure of land mass in the water regime of some areas in the southern tract of the country (e.g. Barisal) some changes in the climatic parameters of temperature range wind movement and rainfall have been detected. The rainfall pattern now shows unusual distribution corresponding to the prevailing water mass in the major rivers and their common extensive estuary of the Meghna through which the maritime climatic condition extends for inland of the country. The recent reduction of river water has resulted in the development of undesired continental climate shown by its characteristic feature of higher temperature range of 24.20F in place of its earlier highly desired maritime



condition having a figure of 21.3°F in Barisal zone which is located close to the estuary to adversely affect the usual northward moisture-funnelling action of the estuary. The region's characteristic water giver wind of monsoon has now been behaving abnormally in recent years causing an uncommon movement of southern wind in the dry season to induce sporadic higher winter rains in some areas. Some water balance studies are also made on the nature of the southern tracts including Barisal following the works mostly related to moisture index given by Thornthwaite (1948) and Subrahmanyam (1955) and Puri (1960). These studies further confirm the above abnormality of Barisal showing a tendency of desertification in recent years because of its drastically reduced moisture index value of 31.5 in place of the earlier figure of 44.6. The geophysical event of land exposure in water regime of the southern part of the country are thus identified to be extremely adverse leading to a dangerous water status for the region and it possibly influences the climate over a much larger area, 17.14. [as published] The present consideration on the environmental change is closely related to the general circulation model (GCM) whose hallmark is the extent to which it accounts for all atmospheric movements viewed horizontally within a framework of 200 to 300 miles across and vertically five to eleven strata. The stochastic (i.e. random) forcing model (SFM) of climatic change proposed by Professor Klaus Hasselmann 4.5 of the Max Planck Meteorological Institute of Hamburg is also significant for Bangladesh because of its geographical location fringing the funnel shaped northern extremity of the Bay of Bengal. [as published] SFM deals with the atmosphere which in conjunction with land and sea constitutes a gigantic heat mechanism in which the oceans play a key role as a storage facility where climatic parameters exert a steady random influence on the vast water mass. The climatic parameters change at zones of high and low pressures that criss-cross the sea being influenced by various factors including the plankton. [as published] Following SFM it may be stated that the occasional depressions originating from differential temperature and pressure fronts in the sea and the Bay cause cyclones and tidal bores in the coastal zone and the accompanying heavy showers often devastate the country by floods. The life-sustaining monsoon rains depend heavily on the temperature differentials between marine, aquatic and terrestrial eco-systems of Bangladesh and their changes have already caused large scale modifications in the climate altering the general wind circulation model of the region, 14.15. Only under a condition favourable supply of river water the Meghna estuary which is identified to be the prominent route of water cycle for the region can retain its normal maritime climatic condition, as opposed to the continental ones developed on its two sides for efficiently regulating the highly desired hydrological relationships of the region stated above.

#### Estuarine Wetlands

Compared to the condition most marshy lands the wetlands in and near the Meghna estuary are changing more rapidly in recent years because of the progressive reduction of water of the Ganges. The tree over which is well known for its ability of reducing the above noted temperature range cannot flourish under the circumstances currently prevailing there. The exposed new lands are being used by the local people in various ways as farming and homestead construction. For these purposes they often remove the naturally grown tall grasses (*Saccharum* Sp. Linn.) in spite of its being a costly affair because of their very extensive and deep root system. These tall grasses possess a poor shade-casting ability due to their loose canopy. Moreover, the tops of these tall grasses are very



commonly collected in large scales by the people for thatching and other household purposes. Again, because of uncertain occasional river erosion of the new land masses they often avoid taking proper care of them. Frequent disputes regarding ownership of these lands and other similar commonly occurring encroachments in these areas discourage people's effort of taking their much care. They do not like to grow trees there because of the apprehension of their being damaged by the rise of water during the wet monsoon season. Even the very commonly grown easily propagated, quick growing, highly economic banana plants are often noted to be lacking from the vicinity of newly constructed houses. From environmental point of view these unusual continental conditions in and near the estuary are by no means desired because of its vitally important maritime role on the natural water cycle of the region mentioned above.

Another notable feature of the wetlands of the estuarine zone is the danger for birds' life, such as wild ducks. People including hunters can go very close to the birds by the newly developed land mass to disturb them too much. It is probably for this reason a very large number of wild ducks are noted to take their recent day-time shelter in the well protected big dug tank of Durgasagar Dighi in spite of its location in a densely population areas of the Barisal district.

It may be noted here that a difficulty is faced in ascertaining the exact quantity of water needed to flow through the estuary for the above noted favourable environment at the present state of affairs because people continuously tend to extend artificially elevated lands in the water regime. In case of delay of restoration of normal river water flows, more and more water will, therefore, be needed to submerge the elevated areas for reinstalling the desired previously occurring maritime condition noted above.

It is well known that long-lasting large tidal flows occasionally enter the long distance of the estuary under the influence of the storm surges that result generally from SFM stated above. Such incidental situation, observed recently in hydrology records of BWDB, helps explain the incidence of early monsoonic rains in the country in April, 1980. Though the estuary had a fair supply of water from its major rivers except the Ganges at this time its downward flow diverting this time was practically zero as per water discharge records of Arial Khan Off-take, a station close to the estuary. [as published] The data recorded further indicate the relationship of river water to the recent rainfalls partly reported earlier. [as published] Abrupt variations in the raining patterns at times practically amounting to the rainlessness for months together during the traditionally known uniformly heavy rainfall period including that of the severe drought year of 1979, are explainable in terms of water discharge records of some major rivers in conjunction with abnormal wind movements discussed earlier. For this purpose, however the water discharge records not only of the Ganges and the Meghna estuary at some of its points but also of the combined flows of major rivers and the above noted tidal position of the estuary should be considered. It is to be noted here that the intrusion of saline tidal water in the upland fresh water rivers is well known to accelerate siltation which itself is a harmful phenomenon for the normal water cycle of the regime.

[15 Feb 81, pp 5-6]

[Text] Similar to estuarine wetlands the extensive coastal forested wetlands of mangrove of Bangladesh are ecologically very significant in this environmentally

critical country of heavy monsoon rainfall with pronounced dry seasons. The tidal woodlands of Sundarbans in the southwest and Ghokoria in the southeast of the country occupy an area of more than three thousand square miles. In addition, the eastern part of the Bay is currently getting a sizable newly accreted land located more or less in the mouth of the Meghna estuary. A large amount of sediment is carried down by the run-off of about 1,100 M.A.F. of upland drainage from a catchment area of more than 600,000 sq. miles fed by snow melting water as well as heavy monsoon rainfall annually. The present lack of knowledge of the vast mangrove areas' ecosystem is primarily due to the great expense involved researching in it. So far known the forest of Sundarbans is very rich both floristically and faunistically. It has 334 species of animals excluding unknown numbers of insect, earthworm and other minor groups. This number is very high compared with most other similar regions of the world. Such richness of the living components of the Sundarbans' ecosystem may be attributed first, to the exceptionally varied nature of the environment, and second, to the extraordinary abundance of the raw materials and nutrients for life there. This tropical mangrove with high insolation can be described as a net receiving annually 500 millions tons of soil eroded in the vast catchment area, nutrients leached by the percolation of rains through the soil, organic matter falling into the rivers and the chemical fertilizers employed anywhere in the enormous river basins, all eventually reach the Sundarbans filter. [as published] In addition, nutrients contributed from the Bay itself enter the Sundarbans on the tides at the shifting, fertile interface of brackish water. Unlike the situation in many other mangrove areas the Sundarbans environment varies between moderately saline water and sweet, between excess water at high spring tides of the monsoon to drought conditions during the long dry season, intensified at low tides. Distinct habitats are adjacent: riparian estuarine, shallow marine coastal shelf and deep ocean. Overall these distinct habitats are superimposed the additional flux of tides and tidal bores, monsoon floods, cyclones currents, waves and winds with their occasional highly devastating intensity.

The vegetation of the Sundarbans evokes curiosity because of its largely unusual mangrove ecosystem. It is flushed with year-round upland river water and salinity remains here at relatively low levels. The major plant species, *Heritiera Fomes* Buch ('Sundri') is practically unknown in any other world mangrove and has a strong possibility of having been migrated from its known habitat of the wet overgreen forest of Sylhet of the eastern Himalayan zone. The species does not possess an adaptive tolerance to high salinities as a result of which it dominates in the northern part of the forest where salinities, are the lowest. All Sundarbans species except of the palm, *Nipa Fruticans* Wurm ( 'Golpata' ) appear to be distributed according to long term salinity patterns influenced by tidal inundations similar to the tropical mangrove species elsewhere. This palm predominantly occurs in frequently inundated low salinity areas along the banks of near freshwater rivers in the Sundarbans. The known specific requirement of freshwater flushing for the successful growth of the plant is best obtained in its unusual habitat in this forest that experiences long pronounced dry seasons unlike many tropical mangroves. Historic abundance of river water favours the Sundarbans to differ widely from most tropical mangroves as evidenced from a very low community coefficient figure of 12.50. It is strange that the Sundarbans forest is not very close floristically even to its neighbouring less riverine mangrove forest at Chokoria (community coefficient 20.00), a fore saline area



almost similar to other tropical coasts with which it shows a better floristic identity (community co-efficient, 24.00) when compared according to the method outlined by Kulczynsky, [as published]. It is to be noted here that the extensive new land masses noted above are mostly located in between Chokoria and Sundarbans mangroves and opposite to Noakhali, a good portion of which was eroded and vanished in the Bay in the recent past threatening the highly useful inland position of the Meghna estuary mentioned above.

The coastal forest of Bangladesh plays some role on the hydrological cycle of the region because of its maritime nature and geographical position fringing the Bay of Bengal to easily influence the monsoon water. The forested coastal maritime zone acts as a perennial storehouse of partly condensed water vapour under the influence of the temperature regulating ability of the tree cover discussed above.

The dependence of the Sundarbans on freshwater creates grave concern regarding its future potential if its sources of upland rivers are in short supply either for damming or any other reasons. In recent years when progressive reduction of river water is on record the Sundarbans forest has been deteriorating rapidly. The inadequate inundation of the forest during dry season coupled with above noted sporadic heavy showers following long dry spells, inflicting a grave loss of some critical nutrients, such as molybdenum, potassium and sulphate similar to the phenomenon occurring in some semi-arid deserts has been attributed for the degeneration. Under a condition of decreases in freshwater salinity will increase in low grounds of the forest where mangrove species of high salinity tolerance may predominate though nothing good can be expected regarding their growth pattern in the elevated Sundarbans as per a record made earlier.

#### Implications of Wetlands Environment

It may be noted that the intimate and unavoidable relationship between people and water in Bangladesh is much stronger yet more pivotal than any other nation in the world. The total reliance on capricious monsoonal rainfall, on irrigation and extremely seasonal river flows, raises water relationships to a degree of significance unprecedented elsewhere. The Bangladeshi depends upon water for fishing in rivers and wetlands during cultivation of rice in irrigated and rain-fed lands, in the ubiquitous multipurpose tanks and an infinite number of fishponds. This essential and inseparable bodily contact with water sensitizes all water related concerns, particularly water borne disease. In addition the excessive population density, the lack of education in sanitation and hygiene, and the low availability of physicians contribute to the fragility of the health environment in the country. This situation is compounded by the widespread malnutrition of the population. Quite an important as specific disease, yet frequently overlooked, is the pervasive environmental stress of Bangladesh. Grindingly laborious work merely to survive, hampered by abject poverty and malnutrition means that any increase either in effort or expenditure of energy for the important commodities of life, such as water, becomes more damaging than such increase would be in many other countries.

As per discussion made above the adverse changes in the wetlands of Bangladesh lead to the extremely dangerous onset of drought and desertification in the environment which transcends political boundaries. Rice cultivation is the chief

agricultural activity of the country and it has been suffering most from dry season decrease of river flows. Annual rice production increased in Bangladesh in the past and it is possible to improve this achievement in future. For this, the understanding of the relationship between wetlands use and environmental modification is important because agriculture supports almost 90 per cent of the country and agricultural products generate 90 per cent of national exports. Practically not much land is available here to be brought into cultivation, and a constant area support an increasing population. It is, therefore imperative to use the land as productively and rationally as humanly possible in this country.

### Summary

The ecology and environment of Bangladesh wetlands are critical, delicate and easily vulnerable because of historic abundance of its water from which life is emanated. The country is well known for its average high rainfall. Its geographical position in the south slope of the world's highest mountain of the Himalayas and along the cone-shaped northern extremity of the Bay of Bengal, its abundance of large rivers and estuaries, very wet rainy days followed by pronounced dry seasons and the very extensive coastal mangrove forests with many endangered biological species make it ecologically very interesting.

Under a condition of redent exposure of land mass in the water regime of the southern tract of the country some changes in the climatic parameters of rainfall, temperature and wind movement are detected and it is inferred that the recent anomalous condition in the rainfall pattern of the country is primarily due to the reduction of river water resulting in the development of undesired continental climate in place of extremely useful maritime one in the southern zone of the country. [as published] The region's characteristic water giver wind of monsoon has been behaving in an unusual way in recent years. Such anomalous monsoon wind is identified to be extremely adverse leading to drought and aridity in the region. Of the known theories of climatic change the general circulation model (GCM) coupled with the stochastic forcing model (SFN) well explains the notable changes in the environment of the country. Since only under a condition of favourable supply of river water the Meghna estuary, the recently known prominent route of water cycle for the region, can retain its normal maritime condition for efficient northward funnelling process of water vapour to regulate the highly desired hydrological relationships of the region the increased supply of upland river water through the estuary is the safe and permanent remedial measure of these adverse climatological changes.

A temperature fluctuation controlling and rainfall influencing role of the Sundarbans mangrove forests has been detected recently in the course of the study of the relevant climatological parameters prevailing in and near these forests. Currently these forests are deteriorating fast because of inadequate inundation by the reduced dry season water supply accompanied by sporadic heavy showers of recent years causing a grave loss of some critical nutrients, such as potassium, sulphate and molybdenum from the soil because of untimely accelerated run-off. The soil of these forests being predominantly clay an immediate care is urgently needed to keep them sufficiently wet to avoid the serious and irreversible degeneration of the forests. These extensive forests are largely unusual mangroves and a very low community co-efficient of 12.50 has been recorded for

these forests in a comparative study of mangroves occurring in some South-east Asian countries. The Sundarbans forests need year-round fresh tidal water in this country of pronounced dry season for salinity to remain at relatively low levels favouring the growth of the major plant species of 'Sundri' (*Heritiera Fomes* Buch) a near freshwater species not practically known in any other world mangroves. The coastal forests help directly the continuation of the much useful inland position of the wide estuary of the Meghna noted above in addition to their well known tidal bore mitigating ability. Tapping of water of rivers of the Himalayan origin that supply water to the Meghna estuary should, therefore, be done judiciously to avoid the disaster of desertification in the region.

CSO: 5000

## BANGLADESH

### BRIEFS

**BRAHMAPUTRA SURVEY**--Chatbari (Sirajganj) Feb. 17:--State Minister for Power Water Resources and Flood Control L. K. Siddiky said here today a survey is going on the River Brahmaputra, reports ENA. The survey he told a public meeting was on river training and erosion on the Brahmaputra, the survey is likely to be completed by August next, he added. [as published] [Text] [Dacca THE BANGLADESH OBSERVER in English 18 Feb 81 p 1]

CSO: 5000



## AGRICULTURE MINISTER ADDRESSES WILDLIFE PARLEY

Bombay THE TIMES OF INDIA in English 26 Feb 81 p 5

[Text]

NEW DELHI, February 25.

INDIA assured the international conference on trade in endangered species here today that the concept of conservation was very much kept in view in the country's efforts to maximise exports.

Opening the 10-day conference on the Convention of International Trade in Endangered Species (CITES) of wild fauna and flora, the agriculture minister, Rao Birendra Singh, pledged India's full support to international efforts for conservation through agreements like the CITES.

In other introductory speeches, the chairman of the standing committee on CITES, Mr. Ruck Poonia, and the representatives of global conservation and environmental protection agencies spoke on the charting of a new course for international law on trade in the species. They explained that trade in these items had become big business.

The agriculture secretary, Mr. S. S. Puri, divided India's contribution to conservation of such species even if it meant curtailing of exports of some items. He also referred to the setting up of a department of environment.

Rao Birendra Singh informed the 150-odd participants representing 67 governments and 100 national and international organisations that India, as a contracting party to the CITES, had set up a network of national management authorities with four regional offices where the scientific authorities operated in direct communication with one another and with the CITES secretariat. There was an effective control on trade on more species of wild flora and fauna through legislative enactment.

The minister spoke of the prime minister's total commitment to the policy of conservation which "not only seeks to protect and preserve what remains of our wild fauna and flora but also seeks to augment this priceless national heritage."

He mentioned a recent enactment under which the state government or any other authority is denied the power to de-reserve any forest area or divert a forest area to non-forest purposes except with the prior approval of the Central government. He said the new law would greatly help in checking the loss of habitats, which was the main cause for worldwide decline of wildlife.

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## PESTICIDE THREATENS FORESTS

Nathmandu THE RISING NEPAL in English 3 Mar 81 p 3

[Text] London, March 2--A United Nations Food and Agriculture Organization (FAO) programme to eliminate the Tsetse fly threatens to destroy all of Africa's forests, the British Sunday newspaper OBSERVER reported yesterday, says AFP.

Under a 885-million-pound (442-million-dollars) programme, the newspaper said, "the West is using the FAO to support its ailing chemical industries through the sale of strong pesticides, such as DDT, that are banned for environmental reasons in Europe and the United States."

Humans and cattle are infected with trypanosomiasis (sleeping sickness) by the Tsetse fly, which infests large sections of central Africa.

According to the OBSERVER article, citing the World Health Organization, 7,000 people contract the disease each year and about 350 of them die.

The OBSERVER said that the aim of the pesticide project was to permit a major boost in cattle production. However, it added, most of the meat produced would be processed and shipped to western markets, providing little benefit for impoverished Africans who often have protein-deficient diets.

"Since 1979," the article said, "it has been the organization's (FAO's) declared intention to destroy the forest land and turn it over to pasture but this would simply expose the soil to leaching and consequently distort monsoon rain patterns to the north."

The result would be an "ecological disaster," the OBSERVER said. Effects of the forest clearing would be keenly felt in the Sahel district, which is already suffering from drought conditions.

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**MARSH GAS CALLED REVOLUTIONARY RURAL ENERGY SOURCE**

Guangzhou HUANJING [ENVIRONMENT] in Chinese No 6, 30 Dec 80 pp 8-9

Article by Qu Geping [2575 2706 1627] Deputy Chairman of the Environmental Protection Leadership Team Office of the State Council]

[Text] Energy sources have a very great effect on the environment. Modern air pollution was caused by the use of coal as fuel for power. From the 1940's to the 1950's, air pollution grew to be serious, and due to sustained discoveries of petroleum resources and their explanation in large quantities, the direction of fuel for power turned to petroleum. Meanwhile, light industries and chemical industries that use petroleum as their raw material appeared, and a new stage of environmental pollution represented by petroleum pollution began. With the petroleum resource crisis, many countries began to develop nuclear energy, with its ensuing radiation pollution. To date, all major sources of energy developed by mankind are quantitatively limited, while their environmental pollution effects are serious.

Is there a source of energy that will never be used up and will not pollute the environment? This type of energy indeed exists in nature. For example, there are solar energy, wind energy, geothermal energy, tidal energy, bio-energy, etc. These energy sources have been utilized by man for a long time, but due to the limitations of technical and economical capabilities, their scope of utilization is small and their development has been slow, and they have been unable to meet the needs of the rapid development of mankind. As mankind faces the reality of a worldwide energy crisis and serious environmental pollution, emphasis is again given to these ancient resources of energy, always discarded but of unlimited quantity.

The situation with regard to energy resources in China may generally be divided into the following two areas: One is in the industrial regions represented by cities, where coal is the major fuel. A large quantity of dust, sulfur dioxide, and nitrogen oxide is emitted into the atmosphere, creating the so-called coal type of air pollution. The other area is in the rural villages, where the fuel is mainly the direct burning of organic energy, and the effect on the environment

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This paper was originally written by the author for the journal MAZINGIRA, of the Environmental Office of the United Nations.

is manifested primarily by the destruction of the natural ecology. China is the most heavily populated country in the world, and 85 percent of the people live in rural villages. The fuel used in their living is mainly plant stems, leaves, and firewood, which they burn. This form of utilization of bio-energy resources has been carried down from antiquity to the present day. Since the establishment of new China, the state has provided the rural villages with large quantities of coal every year, and wherever there are hydrological resources, small hydro-electrical power stations have been built, thus causing some changes in the fuel structure. Nevertheless, 90 percent of the farmers still use the traditional manner of burning plant leaves and firewood directly. It is estimated that every year the rural villages burn up more than 500 million tons of bio-energy sources. When this is calculated in heat energy, it is close to the equivalent of 400 million tons of coal, putting it in second place in the nation's energy resource structure. When this much bio-energy source is burned up, the fuel needs of the rural villages remain unresolved. With further development of production, continued improvement in the standard of living, and the increase in the population, the fuel deficiency contradiction will become increasingly critical.

This form of direct utilization of organic energy sources produces a harmful effect on the environment. It destroys the recycling of organic matter between crops and the soil. Plant stubble can no longer be plowed back into the fields. The soil's organic matter is reduced, the soil becomes hard, and its fertility drops, [adversely] affecting high and stable crop yields. When the stems and leaves of plants are burned up, the [resulting] deficiency of animal feed prevents further development of animal husbandry. The burning of firewood means that trees are randomly cut down, leading to the loss of water and soil and affecting the development of agriculture and animal husbandry. For these reasons, the direct burning of bio-energy resources is an obstacle to the development of agricultural and pastoral production and to the realization of agricultural modernization.

For the purpose of satisfactorily resolving the problem of the energy needs of rural villages, we started to utilize organic marsh gas, based upon a foundation of scientific experiments. Practice has proved that in rural villages, marsh gas is the most economical and reasonable form of utilizing organic energy sources, the most practical and effective way of resolving the problem of energy needs, and the most positive measure for protecting and improving the environment. In rural villages, garbage, wastewater, night soil, plant stems and leaves, and weeds are put in a sealed tank to ferment and decompose, and a combustible gas with methane as its major component is extracted. The technique used at present to extract marsh gas is mainly fermentation under normal temperatures. The marsh gas tank is constructed of cement, concrete, stone, and brick. The advantage of this type of marsh gas tank is the fact that the production of gas is satisfactory, the management is convenient, the construction costs are low, it is safe to use, the raw materials are easily obtainable and regenerable, and there is no environmental pollution. In China, the technique has been brought from the experimentation to the demonstration stage in rural villages, and a new stage of planning and large-scale extension has begun. According to 1978 statistics, more than 70 million marsh gas tanks had been completed in the nation's rural villages, 21 counties had basically realized marsh gas technology,

and 35 million persons were using marsh gas as fuel. This kind of progress, made in the short period of just a few years, is rather a great accomplishment.

In rural villages, marsh gas is beneficial to the nation and its people. The many advantages include the following:

1. A saving of firewood and grass and an increase in income. Less than 50 percent as many plant stems and leaves are used for making marsh gas as for direct burning. For example, the Liangzhu Commune of Yuhang County in Zhejiang used to run 50,000 dan short of firewood every year. Since the marsh gas system materialized in 1978, the commune each year has accumulated several tens of thousands of dan of straw for the market. After this is sold, each household has an average gain of 80 yuan. The cost of constructing a marsh gas tank is about 50 yuan, and so this sum is recovered in less than 1 year.

2. An increase in organic fertilizer, thus promoting increased agricultural yields. Human and animal excrement, garbage, stubble, weeds, etc., contain organic matter. Through anaerobic fermentation in the marsh gas tanks, the portion that is easily decomposed becomes combustible marsh gas, and the portion that is difficult to decompose turns into excellent organic fertilizer. Application in fields has proved that this fertilizer is favorable for soil improvement. It increases fertility and obviously raises crop yields. For example, Wansui Commune in Wujin County, Jiangsu, applied 130 dan/mu of marsh gas fertilizer in 1977, nearly doubling the amount of application in 1976. The unit yield that year showed an increase of 41 jin.

3. Protection for trees thus promoting the development of forestry. Once the marsh gas system is adopted, fuel for daily living is no longer a problem and the phenomenon of willful cutting of forest vegetation stops. The work of afforestation of barren mountains becomes much more effective. For example, in the Hengshan region of Suining County, Sichuan, in the 5 years since the adoption of the marsh gas system, 38.87 million trees have been planted on the roadside of villages, 5 times the total number of trees planted in the 20 years previously. Afforestation of barren mountains amounted to 39,100 mu. The trees have grown into forests and all that greenery provides an appearance of prosperity.

4. Enlargement of source of feed thus promoting the development of animal husbandry. Once marsh gas is utilized, the contradiction between fuel and feed is resolved and a large quantity of stubble and fodder is saved to develop animal husbandry. For example, the Sangzhuang Commune, of Deng County, Henan Province completed its marsh gas system in 1976. Since then, large animals, such as oxen, horses, donkeys, and mules have increased from 2,783 to 3,214 head, an increase of 15.3 percent; hogs have increased from 9,643 to 14,872 head, an increase of 54.2 percent. The development of animal husbandry has further increased the quantity of organic fertilizer, promoted increased crop yields and raised the income of the members.

5. Reduction of labor intensity saves the work force. After the marsh gas system is completed, such odd jobs as cutting firewood, transporting the coal, etc., are eliminated, many people are freed from the heavy toil of domestic work,



and the agricultural labor force is strengthened. For example, in Sanghua Commune, before there was marsh gas 37 percent of the women participated in farm labor; afterwards, the rate of participation increased to 85.5 percent.

5. A supply of inexpensive power accelerates the progress of agricultural mechanization. Using marsh gas for motive power requires little investment and produces fast results. Many regions have constructed marsh gas power stations to generate electricity. According to preliminary statistics, 560 marsh gas power stations with a total of 6,400 horsepower have been built in the rural villages of the nation, and 150 marsh gas electricity-generating stations with a machine capacity of 1,600 kw. A new, inexpensive energy source is thus provided for pumping water, irrigation, threshing, milling, and other auxiliary farm industries. Marsh gas technology is now being developed from providing for daily living to production.

Aside from direct economic benefits, the greatest effect of developing marsh gas in rural villages is the protection of the natural environment for the promotion of the overall healthy development of agriculture, forestry, and animal husbandry. Due to the needs of marsh gas tanks, the construction of latrines and animal shelters is being designed so that the manure may go directly into the tank. The open tank type of toilets has been eliminated, and so have the odors and the breeding grounds for flies and maggots, giving a new appearance to environmental sanitation and improving the health standards of the people. According to a survey in Taoyuan Commune, Wujiang County, Jiangsu, since the human excrement has been directed into the tank for fermentation, the quantity of schistosome eggs has been reduced 68.5 percent and larvae 96 percent. These eggs will not become larvae after they are in the tank for 15 days and will completely die in 26-30 days. Hookworm eggs will all die in 30 days; 71 percent of roundworm eggs will become deformed in 4 months. There have been 3,781 fewer hookworm patients in that commune, and there has been a reduction of 1,764 roundworm victims. The incidence of schistosomiasis in Hongxing Brigade in that commune has dropped 95 percent.

Marsh gas has started many changes in the way of living in rural villages. Due to power generation with marsh gas, there has been extensive development of night schools, broadcasting, television, motion pictures, and scientific experimental activities. It is not only a revolution of fuel, but also an impetus for the development of science and culture in the rural villages.

The bio-resources for marsh gas manufacture are extremely rich. It is estimated that if half of the human and animal excrement and crop stubble (other than that which is used as raw material for feed and industry) is used to produce marsh gas, not only may the fuel needs of every rural household be completely met, but there can also be enough fuel for 800,000 power stations generating 7.5 kw each. The inexhaustible bio-energy resources have pointed out a promising future for the resolution of the problem of power required for living and production in rural villages. As an important item of agricultural modernization, the Chinese Government is in the process of mobilizing a nationwide effort to develop marsh gas systems.

6248

CSO: 5000

# BRIEFS

**BIODEGRADATION OF ORGANIC PESTICIDES**--From oxidation pond systems, organic phosphorus decomposing bacteria are first concentrated and isolated to observe the degradation characteristic and to determine the organisms possessing purification actions. It is further proved that in the purification process, the organisms of various different species and colonies perform different functions. The metabolic pathway of parathion [1605] in the oxidation pond system is studied and a cell-free enzymatic agent for the parathion degradation microbes is prepared. The enzymatic agent has very high hydrolytic activity for parathion and a theoretical explanation of its action in degrading parathion during the purification process is offered. The paper also discusses the theory and practical significance of enzymatic degradation of organic pesticides in environmental science. [Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese Vol 1 No 2, 30 Apr 80 pp 8-13] 6248

**BIODEGRADATION OF CHLOROBENZENE COMPOUNDS**--Chlorobenzene compounds exist extensively in waste water of dyestuff, pharmaceutical, agricultural chemical, and paint and varnish industries to pollute the environment seriously. In the surface water of China, the maximum permissible density is set at 0.02 mg/l. In a foreign country [USA] it was reported in 1977 that *Pseudomonas* was found to be capable of breaking up the benzene ring of paradichlorobenzene 100 percent within 92 hours. The authors isolated No 441 strain of this genus from soils near the waste water holding tank of Tianjin Chemical Plant. After culturing, they were found to be effective for eliminating paradichlorobenzene 100 percent in 5 repeated tests. Further identification produced 441a and 441b strains which have now been identified to be *Plesiomonas* and *Bacillus cereus* respectively. [Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese Vol 1 No 2, 30 Apr 80 pp 14-16] 6248

**CARBON MONOXIDE MONITOR**--For the purpose of determining carbon monoxide in atmosphere to the ppb level, many theoretical studies have been carried out in foreign countries. Mercury replacement reaction was reposed and studied in the 60's and in the 70's various special instruments were produced to complete automated monitoring systems. In China, there have yet been no reports of highly sensitive monitoring instruments. The authors studied related literatures and improved over the original design of mercury testing instrument to design the instrument for monitoring carbon monoxide in the atmosphere. The reaction time of the instrument is very fast, starting with 1 second after the specimen is introduced. The sensitivity is high; it is capable of detecting a minimum density of 0.05 ppm. [Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese Vol 1 No 2, 30 Apr 80 pp 14-16] 6248

AMMONIA, FLUORIDES MONITOR--Fluorine ion selective electrode and ammonia sensitive electrode are used to proceed with automatic and continuous monitor of various waters. Electromagnetic valve is used to regulate the instrument for completing such procedures as washing and marking the electrodes, adding and draining fluid, picking up specimens, etc. Direct current digital voltmeter is used for direct display of electrical potential obtained from the test tank to be delivered to an electronic computer for computation and for fast and continuous print-out of related data. [Beijing HUANGJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese Vol 1 No 2, 30 Apr 80 pp 33-38] 6248

GAS DIFFUSION STUDY--Through meteorological observation and gas diffusion tests, this paper analyzes the gas diffusion principle under different meteorological conditions and discusses the effects of the meteorological condition on the area and density of dispersion and distribution of harmful gases. [Beijing HUANGJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese Vol 1 No 2, 2 Apr 80 pp 50-55] 6248

TREATMENT OF WASTEWATER--For the treatment of chromium containing wastewater, the available techniques include the electrolytic method, the precipitation (barium salt and lead salt) methods, the humic acid method, etc. but none of these can be used to reclaim and utilize the chromium resources. There is also the ion exchange method capable of reclaiming chromium, but the chromium solution reclaimed contains  $\text{Cl}^-$  and may be used as purification solution only. For the purpose of cyclic reclaiming and utilizing the chromium containing wastewater discharged by various types of factories, some studies have been carried out in foreign countries but very few of them have been reported in China. For this reason, the authors carried out a study on the extraction of chromium from wastewater using tributyl phosphate [TBP]. This paper reports the successful experiment. [Beijing HUANGJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese Vol 1 No 2, 2 Apr 80 pp 55-60] 6248

BETTER ENVIRONMENTAL PROTECTION URGED--Beijing, 15 Mar (XINHUA)--Today's Beijing DAILY calls for better environmental protection in the Chinese capital in response to a recent State Council decision on strengthening pollution control throughout the country during the present national economic readjustment. The decision specifically asked Beijing to be the pacesetter for the nation in the anti-pollution drive. The paper says that remodelling of 970 boilers and 40 kilns in the city last year saved 30,000 tons of coal and reduced discharge of air polluting sulphur dioxide by 900 tons. Central heating installed in apartment houses cut a big number of boilers and chimneys used for residential heating. Presently the discharge from 80 percent of the boilers is within state standards. Some advance has been made in controlling water pollution in the Tonghui River in Beijing's eastern suburbs. The completion of 35 major water purifying projects last year in 79 factories which used to discharge toxic substances into the river has helped. The Beijing No 2 pharmaceutical plant recovered 7,620 tons of useful material worth more than one million yuan, thanks to the 19 pollution control projects the plant put in last year. In a commentary, the Beijing DAILY points out that environmental pollution is still very serious in Beijing though initial successes have been achieved in anti-pollution work. Strenuous efforts must be made to cope with the growing pollution that comes with expanding industry and urban construction. [Text] [OW150735 Beijing XINHUA in English 0717 GMT 15 Mar 81]



HEILONGJIANG AFFORESTATION--In 1980 some 3.5 million mu of land in Heilongjiang Province were afforested, 500,000 mu more than called for in the plan. The province raised 480,000 mu of seedlings, an increase of 20 percent over 1979. The 21 municipalities and counties in the west of the province, which have participated in the three north shelter-forest construction, increased the percentage of forest cover by 0.8 percent over that of the previous year. [Harbin Heilongjiang Provincial Service in Mandarin 2200 GMT 18 Feb 81 SK]

CSO: 5000

SEVEN-POINT PROGRAM DESIGNED TO FIGHT MARINE POLLUTION

Port-of-Spain TRINIDAD GUARDIAN in English 23 Feb 81 p 1

[Article by George Harvey: "Spy-In-Sky Plan for Oil Spills: Idea Among Projects at CAP Talks"]

[Text:] A spy-in-the-sky programme is planned to combat the illicit discharge of oil by sea-going tankers and cargo vessels in Caribbean waters. This is part of a seven-point scheme to deal with problems related to deliberate and accidental marine oil spills in the high-risk Caribbean region.

The scheme is among the 66 projects in the Caribbean Action Plan (CAP) to assist governments of the wider Caribbean region in improving the environment which will be discussed at a meeting in Managua, Nicaragua, today.

Oils spills control projects outlined are:

--A framework for regional cooperation, with particular reference to island-states and territories in the CAP.

--Development and implementation of an oil spill preparedness training programme.

--Development of national contingency plans and sub-regional arrangements for cooperation and mutual assistance in combatting oil pollution, with special reference to Central and South American countries participating in CAP.

--Harmonising procedures to monitor tanker slop residues at tanker terminals in the Caribbean.

--Study on the disposal of recovered oil and oily debris to determine the method most adaptable to island nations and results in the least long-term environmental damage.

--Study of beach-cleaning methods for recreational beaches which suffer from varying degrees of erosion.

Report on the action plan notes that the region has become an area of intense oil production, refining and tanker transport activity.

There are 73 refineries (two in Trinidad), with refining capacity of more than 12 million barrels a day...more than 50 tanker ports with capacities to handle vessels ranging from 10,000 to 500,000 deadweight tonnes.

It is estimated that there are about 100 loaded tankers in the Caribbean region at any one time 25 per cent of which are VLCCs (very large crude carriers).

The project report states: "The possibility of serious oil spills in the open sea, as well as those originating from terminal activities and offshore activities, has increased, and with it the potential for crippling environmental and economic damage."

Reference was made to the Aegean Captain--Atlantic Bypass collision off Tobago in July, 1979, when 250,000 tonnes of oil was at risk and partially spilled.

Accidental spills through ship groundings admittedly 'pose a great risk to the environment."

However, it is stated that.. "it is the repetitive deliberate discharge of residues from oil cargo tanks and other oily wastes into the sea during the operation of tankers and cargo vessels, which account for the greater volume of oil pollution associated with the transport of oil by sea."

It is pointed out that a formidable array of international codes for the construction, equipment and operation of tankers "when adequately implemented and enforced, should serve to reduce the occurrence of operational deliberate discharges of oil from ships."

Frequent reports of beaches being contaminated heavily with tar balls "would suggest that acceptable operational procedures are, in fact, not being complied with in a significant proportion of ballast voyages."

Several reasons were advanced for non-compliance. The project report states:

"Lack of any serious surveillance of tanker routes is an open invitation to improper operations of tankers, since the possibility of a violation being detected does not really exist."

Inter-related projects to deal with the problem include:

--Aircraft surveillance of tanker routes to detect violations of oil discharge regulations and standard procedures.

--Monitoring of all oil residues retained on board ships.

--Determining whether receiving facilities at oil loading terminals are adequate.

--Results from these activities "should lead to a proper evaluation of the causes of present chronic pollution of beaches by tar balls."

CSO: 5000

## GOVERNMENT ACTS TO COUNTER SHELL TANKER OIL SPILL

### Emergency Measures

Kingston THE DAILY CLEANER in English 26 Feb 81 pp 1,14

[Text] Emergency measures were ordered yesterday to counter the possible effects of an oil spill from the Shell tanker Erodona which ran aground off the Alligator Pond coast, St. Elizabeth on Saturday.

A special team is being flown into the affected area today to assess food needs of residents following damage to the fishing industry.

After a meeting at Jamaica House yesterday morning under the chairmanship of Prime Minister Edward Seaga decisions were taken advising against the catching or eating of fish caught in areas along the St. Elizabeth and Clarendon coastline and against swimming in the area.

A Jamaica House statement said:

"At a meeting this morning at Jamaica House between Prime Minister Edward Seaga and various government agencies, under the chairmanship of the Prime Minister, the following points were decided on, arising out of an oil spill on Saturday off the Alligator Pond coast, St. Elizabeth, after the oil tanker 'Erodona' ran aground:

(1) That the public be advised that no fish caught in the areas of Alligator Pond, Treasure Beach, Farquhar Beach and Milk River, since the mishap on Saturday, should be eaten until further notice. Reason is that the dispersant which has been used by the Shell Company West Indies Limited to control the oil spill, if consumed by humans, will lead to skin irritation and vomiting. If consumed in sufficient quantity, the result could be even more dangerous. [as published]

(2) That the public be advised that persons should not swim in the water in the abovementioned areas, until further notice, as this, too, will bring about skin irritation and other harmful effects.

(3) That fishermen are directed not to fish in the affected areas, until further notice. The Coast Guard and Fisheries Division of the Ministry of Agriculture

will monitor these areas, to see that no fishing is undertaken, so as to make certain that the only fish reaching the marketplace are fresh from safe areas.

(4) That a meeting be held with the management of the Shell Company regarding assessment of the damage done because of the oil spill, and also to discuss the question of compensation and regulations regarding oil spills.

An emergency team is being flown into the affected area today, to assess the food needs of residents, and to replace the protein content of the diet of residents, arising out of the loss of fish in their diets.

Arising out of today's meeting at Jamaica House, a management committee headed by special adviser the Prime Minister Seaga, Mr Allan Isaacs, has been set up to investigate the situation. Six sub-committees have been formed to deal with such things as testing for damage, food requirements of residents in the affected areas, loss of earnings and equipment by such groups as fishermen, monitoring and policing the area to prevent fishing activity, and dissemination of publicity and information to the public.

The secretariat of the committee will be headed by Dr Ronald Irvine, Senator in the office of the Prime Minister.

The committee will meet again tomorrow morning, and regularly, until investigations into the spill are complete. The subcommittee, meanwhile, will meet and report to the main committee.

Taking part in this morning's meeting at Jamaica House were representatives of the Ministry of Health, the National Resource Conservation Department, the Fisheries Division of the Ministry of Agriculture, the Jamaica Defence Force, the Attorney General's Department, and the Office of Disaster Preparedness."

A release from the Shell Company on the matter reported that salvage operations had commenced and it was anticipated that by today, the vessel Erodona, would be cleared off shore and at anchor.

But the company later said in response to the statement from Jamaica House, that the dispersant used to break up the oil slick, was non-toxic to marine life and to human beings when used as it had been at Port Kaiser. The company said that the dispersant was supplied by the Esso Refinery.

The company said it was concerned about the worries being expressed in relation to the toxicity of the dispersant, which was recommended by the Clean Caribbean Corporatives. Not more than 50 gallons were used in the operations, the company said, adding that no risk should be involved.

The ill-fated 19,656-ton tanker ran aground in choppy seas while manoeuvring to dock last Saturday at Port Kaiser. Its no. 1 cargo tank was holed, sending oil slicks eight miles east of Port Kaiser. The tanker was carrying 6.5 million gallons of oil.

Divers yesterday began assessing the damage at the bottom of the tanker. The GLEANER understands that salvage operations were delayed because of an accident involving one of the crew's member, but details of this could not be obtained yesterday.

## Economic Impact

Kingston THE DAILY GLEANER in English 27 Feb 81 p 1

[Excerpts] Public health teams yesterday ordered the dumping of thousands of pounds of fish caught off the St. Elizabeth coast near Port Kaiser and Alligator Pond in an effort to prevent them reaching the market.

The teams went through the main fishing villages yesterday at Alligator Pond, Treasure Beach and Milk River to assess the effects of this week's oil spill and the dispersant used to break up the slick the oil spill caused when the Shell tanker Brodona ran aground Saturday and damaged its No 1 oil tank, and 15,000 gallons of bunker C fuel leaked into the sea from it. The tanker was refloated Wednesday night.

The economic effects of the ban were being felt in the small fishing villages. Villagers said that food vendors who sold them ground provisions and in turn bought their fish, were not coming to the villages because of the ban. They complained that only salt fish and sardines could be obtained to replace the lost fish, but most of them said that they preferred their fresh fish. "Salt fish and sardines ah no proper food." [as published]

It was difficult to ascertain the exact number of fishermen affected, but villagers at Alligator Pond estimated that with 200 boats in one village alone and three men to a boat, the number of people affected ran into thousands when their families were considered.

They complained that boats were stained with oil, engines were damaged; shrimps were dying and no compensation had yet been forthcoming. Most of the fishermen and vendors who were most hard hit by the ban on fish sales, said they hoped it would be speedily determined if the dispersant was dangerous so that the situation could be clarified as soon as possible.

Shell Company (W.I.) Limited has maintained that the dispersant they used to break up the oil slick was non-toxic to marine life and human beings in the quantity used. The company said Wednesday that less than fifty gallons were used and there should be no risk involved.

CSO: 5000



UAE TO ESTABLISH POLLUTION CONTROL CENTRE

London 8 DAYS in English 28 Feb 81 p 57

[Text]

THE UAE government plans to set up a centre with laboratory facilities in Abu Dhabi, to fight industrial pollution. An environmental committee chaired by UAE Minister of Health Sayeed Madfa had its mandate strengthened recently and has been asked to advise on all aspects of the environment. The minister has also discussed the proposed centre with Waleed Shareef, Middle East representative on the United Nations Governing Council for Environmental Programmes (UNEP).

Bassam Kahder, the UN Development Programme representative in Abu Dhabi, told 8 Days: 'UNEP has offered to lend the UAE centre at least one environment expert. The organisation has also had similar requests from other Gulf countries.'

UNEP has been conducting a worldwide campaign to combat pollution in ten endangered seas, including the Gulf. For these waters, UNEP proposed an eight-nation programme to control pollution, and a formal treaty — the Kuwait

Convention — was signed in April 1978 by the UAE, Bahrain, Iran, Iraq, Kuwait, Oman, Qatar and Saudi Arabia.

The uncontrolled development of the last ten years has had an adverse effect on the environment. Sewage and rubbish facilities have not kept pace with ~~also~~ growth. Bahrain, for example, still dumps 75 per cent of its sewage, untreated, into the sea. In many Gulf states, water — heavily contaminated with oil — is discharged by empty tankers before they reload.

## ANTI-TRYPANOSOMIASIS SPRAYING THREATENS AFRICAN FORESTS

Nairobi DAILY NATION in English 9 Mar 81 p 6

[Article by Marcus Linear]

[Text] A SCANDAL is simmering in the Rome headquarters of the Food and Agriculture Organisation as the UN agency presses ahead with a dangerous programme to eliminate the tsetse fly — which could also spell the end of the African tropical forest.

Under the \$2 billion programme, the West is using FAO as a conduit to support its chemical industries and get rid of environmentally damaging and banned insecticides, such as DDT. The main object is to increase African beef production, but much of the beef is likely to end up as hamburgers in the West because Africans will not be able to afford it. The programme is being financed by Western banks which African countries will have to repay with interest.

In the early 1970s, Western chemical manufacturers were embarrassed by restrictions in the West on pesticides such as organo-chlorines, which left manufacturers with capacity to make insecticides which no one wanted.

Their salvation came with FAO's tsetse fly programme. FAO launched its war on the tsetse fly in 1974 after the 1974 Rome food conference. It planned to eradicate it from seven million square kilometres.

Tsetse gives man and cattle a sometimes fatal sickness — trypanosomiasis to the scientists (or tsetse for short). According to the World Health Organisation, about 7,000 people get sleeping

sickness every year and about 300 die.

Ten times as many people die of measles in Africa.

FAO set up a "task force" to direct the campaign, with 15 representatives of the agribusiness multinationals specialising in pesticides and veterinary drugs.

According to FAO's original announcement, the land freed for cattle production would be able to carry 120 million animals, producing 1.5 million tons of meat a year, worth \$750 million. About \$350 million has already been committed to the programme.

There are two main criticisms. First, the programme is not proving an overwhelming success. Privately, FAO officials believe that the area of tsetse fly infestation has actually increased since it began. Officially, FAO no longer refers to an "eradication programme" but a "control programme".

Second, if the programme were successful in increasing pasture for beef production, tropical forests would be endangered because the tsetse fly is associated with tropical forests and woodlands.

Disturbance of the forest, as was FAO's declared intention in 1979, would disturb monsoon rain patterns, probably leading to further desert encroachment as the Sahara spread south.

The main weapons in FAO's attack are the frighteningly potent bug killers of the organo-chlorine group — DDT, dieldrin and more recently, endosulfan. These insecticides are so dangerous that their use is banned or severely restricted in the rich industrialised countries. But they are manufactured in the West for export — to be liberally

splashed around the Third World in ever increasing quantities.

Spraying has strong support among African rulers. In addition, corruption, which is rife in Africa, is intimately involved in aid programmes, and "dash" oiled the wheels of the aid machine — which keeps the pesticides flowing.

The principal target for chemical attack today is the

Adamawa Highlands in Cameroon, where between 9,000 and 10,000 square kilometres are being sprayed by helicopter. The programme is planned to last until 1992. Local wildlife experts, environmentalists and health authorities all speak of grave worries about side effects.

Two scientists, Paul Miller and Peter Nagel, working in Cameroon in 1979, produced page-long lists of "non-target" animals which had been poisoned by the spraying. They found spectacularly high levels of dieldrin (between 133 and 174 parts per million) in the livers of fruit bats, part of the local diet.

Many within FAO share the view that pesticide elimination of the tsetse fly can never be achieved but must still not speak openly for fear of their jobs.

However, Javier Prata-Llaurado, director of FAO's Forest Resources Division, and a staunch supporter of the agency's ambitions to ease the food

poverty of Africa, is unequivocal. He says: "I don't think the production of beef in those areas of Africa is motivated by any sufficiently dramatic human crisis to justify risking such an ecological disaster. There are other, better, ways of utilising those resources for human purposes."



FAO's hunters were largely in the dark about the Animal Production and Health Division's quest when J.P. Landry, an FAO hunter from France, doubted whether there is as much tropical forest in Africa as the animal division thought.

There are, in fact, only about 6.5 million square kilometres which can be called tropical forest in the entire continent, roughly two million of it rain forest and 4.5 million woodland. So if "almost all" of the animal division's seven million square kilometres is forest, they must intend to take out every tree left standing in Africa.

— London Observer Service

CSO: 5000

## BRIEFS

BUZI RIVER FLOOD DAMAGE--Beira 23 Feb--More than 5,000 persons were affected by the flooding of the Buzi River in the district bearing the same name located in the province of Sofala. Damage amounting to approximately 10 million contos was registered in the Buzi agro-industrial complex. Moreover, more than 50 houses were destroyed by the rising waters of the river and various fields of rice and corn suffered significant damage. Additional information showed that 246 hectares of cane sugar are under water and that the fury of the waters destroyed a cement-covered 100-meter canal. At the center of this district a large part of the houses were affected by the flood, but no significant damage was registered. [Excerpt] [Maputo NOTICIAS in Portuguese 24 Feb 81 p 1]

CSO: 5000

PESTICIDE CHECK PROGRAM IN FINANCIAL TROUBLE

Salisbury THE SUNDAY MAIL in English 15 Mar 81 p 5

[Text] A Government programme to monitor pesticide residue levels in Zimbabwe may be forced to stop next month, even though results from its first samples showed that many agricultural products and some species of birds may already have unacceptable residue levels of DDT and other pesticides.

A spokesman for the Natural Resources Board said last week that the 18-month-old programme--originally intended to run several years--was short of funds and equipment.

The programme could be continued for as little as \$15 000, but the money was not available. The resources of the Department of Research and Specialist Services, which was responsible for the analysis of samples, had simply been overburdened, he said.

Since early 1980 about 3 700 samples of fish, soil, mothers' milk, dairy products, animal fat and birds' eggs had been taken.

But 3 600 of the samples were still waiting to be analysed and more samples would have to be taken over the next few years if the danger--or lack of it--posed by the residues of DDT-type pesticides was to be established.

The spokesman said: "For those who are less concerned with preserving our wildlife and natural resources than with agricultural production and costs of pest control, it should be pointed out that if Zimbabwe wishes to export produce, standards must reach the World Health Organisation requirements.

"Indications registered so far suggest that many products contain an unacceptable level of chlorinated hydrocarbon toxins.

"Authorities are well aware that headlines to the effect that mothers are transmitting dangerous pesticides to their new-born babies through their own milk would cause alarm and probably panic.

"This was the case in Sweden several years ago when it was revealed that DDT had appeared there in mother's milk in the range of exposure at which laboratory animals begin to show biochemical changes."

If the monitoring programme results were to prove such levels to be the norm in Zimbabwe and that such levels were indeed dangerous, recommendations would no doubt be made to ban chlorinated hydrocarbons or restrict their use.

A warning of toxophene for dairy cows appeared in The Farmer magazine last month after tests showed that levels in milk and dairy products were unacceptable.

Milk from Umtali showed higher residue levels than the milk from other areas.

CSO: 5000

# CREATION OF SEPARATE ENVIRONMENTAL PROTECTION STATE COMMITTEE PROPOSED

Moscow PRAVDA in Russian 25 Jan 81 p 3

[Article by A. Ulitin, division chief of the RSFSR Main Administration of Hunting and Game Preserves: "Under the Protection of the Law"]

[Text] Section IX -- "Environmental Protection" in the draft of the Central Committee to the 26th Party Congress is especially close to me. The direction and coordination of this work on a national scale were entrusted to the USSR Ministry of Agriculture or more precisely to its Chief Committee for the Protection of the Environment and Public Preserves and to the administrations of forestry and hunting. But the sphere of responsibilities of the chief committee do not coincide with the basic function of the ministry which primarily concerns itself with the development of agriculture and animal husbandry.

In the country there is the USSR State Committee on Hydrometeorology and Environmental Control, but its primary area of competency is the atmosphere. I think, the time has come to create an independent organ -- a state committee of the USSR Council of Ministers for managing the protection and utilization of natural resources. Such a decision would eliminate the lack of coordination in the structure and subordination of existing institutions for the protection of the environment in the Union republics and would simplify the system of state control and administration in this area. Centralization would have a positive effect on the effectiveness of environmental protection measures.

There is a considerable amount of work to be accomplished in regulating the legal aspects of the regulation of interdepartmental and sectorial interrelations. Let us say, the recently adopted law, "On the protection and utilization of the animal world" is imposed as a duty on enterprises, institutions, organizations, and citizens to prevent the destruction of animals and their environment as a result of industry and the use of means of transportation. Its implementation can be more successfully guaranteed under the conditions of a unified governmental leadership with respect to environmental protection measures.

A complicated situation, for example, arose in the steppes of Kalmykiya. There irrigation canals intercepted the mass migration paths of the saiga (antelope), which became the reason for the destruction of these animals, mainly the females with calves and young animals. The USSR Ministry of Irrigation and Water Management has not to this day provided for the necessary volume of work to correct this problem: of the 64 planned crossings only 21 have been constructed.

Claims have also been made against the Ministry of the Petroleum Industry. At extraction sites there have been spillages from bore-holes and pipe-lines because of violations of technical standards and manufacturing methods. The tragedy is that the elimination of oil spills is very difficult and that such spills become regular traps, especially at night. Imagine: a flooded "pond" of oil in the moonlight has a smooth surface exactly like that of water. Any birds alighting on it, as a rule, perish.

The general requirements providing for the protection of the animal world are contained in article 8 of the above-mentioned law. A state committee for environmental control and utilization of natural resources could work out and introduce more concrete and active protective standards to present to enterprises and institutions. Similar documents exist, for example, in forestry legislation and have justified themselves well in practice.

How much the scale of construction in the country has increased and the kinds of large projects being erected are well known. I think that provisions should be made for deductions for animal protection organs in the form of continually collected fees already during the draft planning stage of projects. It would be advisable to ensure that enterprises have an economic interest in environmental protection. This is something for the planning organs to think about.

After the words on improving the governmental management of the use of nature and environmental protection in section IX I propose the following: "For this create a national organ". Then insert: "to regulate the system of the legal regulation of relations in the area of environmental protection, to activate the working out of scientifically based ecological-economic standards enabling the rational utilization of nature".

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## ENVIRONMENTAL PROTECTION PROJECTS PLANNED

Nicosia I SIMERINI in Greek 4 Feb 81 p 9

[Text] Limassol, 3 Feb (SIMERINI Office). In an interview with I SIMERINI, Limassol District Governor N. Fylaktou said that because of its location [the city of] Limassol lends itself to great touristic development. Following the loss of the Kyrenia and Famagusta tourist facilities Limassol received the largest part of government subsidies for its development.

Fylaktou added that in 1974 Limassol had 3-4 tourist hotels with a limited number of beds. In the past 5 years the hotels and other tourist units have multiplied. At the same time, tens of apartment buildings were built along the shore and other Limassol areas.

Without doubt, said Fylaktou, the Lebanon situation between 1976 and 1978 increased the demand for apartments and tourist units and Limassol coped with the situation satisfactorily. With regard to the regulations for building tourist units Fylaktou said:

"The construction of hotel and other tourist units in many areas outside the city limits has been regulated since 1974 by city planning regulations whose aim is to save the natural environment."

## Binding Plans for Laying Out Streets and Squares

With regard to the city's tourist section, the district governor said that through the Cyprus Tourist Organisation [COT] the government has used to best advantage parts of Dousoudi as a tourist beach and has implemented institutional measures for broadening road arteries and for the construction of sidewalks in the tourist area. Since 1974 there has been in force a binding plan for street and square laying on the main Limassol-Nicosia road from the Agios Georgios bridge as far as the old Limassol. The plan calls for 10-foot sidewalks on both sides and a 24-foot-wide two-lane road separated by a 12-foot-wide island. However, implementation of the plan is tremendously expensive because, besides the acquisition of the land, it will be necessary for the property owners to construct sidewalks thus considerably increasing the value of their property since a new amply lighted road artery will be constructed with underground telephone, electricity, and water facilities and a proper system for rain waters.



## Sewerage Construction

One of the serious problems Limassol faces is the lack of a sewer system about which Fylaktou said: "A Sewerage Construction Council has been established and its authority is extended to the tourist areas of Agios Georgios, Germasogeia, and Amathous. The relevant economic and technical study has been completed and it is expected that the council will soon draw up the specifications for the appropriations needed for the construction of the project. But despite the fact that the plan will be completed in various phases with priority for the beach section the first phase is not expected to be completed before 6 to 8 years."

## Wastes

Another problem this tourist area faces concerns the store wastes which often are emptied into the sea. Said Fylaktou on the subject: "The presence of a large number of business stores in the seashore area raises the problem of the wastes. To avoid their being thrown into the sea the government has forbidden their dumping within a radius of 100 meters from the shore. In the meantime, the government has hired sanitation engineers one of whom will be stationed in Limassol to advise the local authorities and the government agencies on the best methods of purifying the wastes. At the same time, the Port Authority is studying ways of avoiding the pollution of the harbor area caused by ships casting anchor there. Arrangements have been made for all ships to cast anchor further to the west of Limassol and away from the tourist area."

## Jetties

As concerns the issue of the illegal construction of jetties by private store-owners, the district governor said:

"These jetties were built for the purpose of protecting the shore from erosion and in some cases efforts were made to usurp the shore area and the small private ports. Measures have been taken to prevent the construction of new jetties. The government has hired a foreign expert to study the problem and report on ways to protect the shore from erosion and to develop a new sandy beach.

"It is hoped that the report will be ready the first quarter of 1981 and that the government will adopt the proper measures for the unimpeded use of the area by the public and the tourist businesses without any intervention as concerns their installations."

## Development of Pitsilia

Regarding the problems of the Limassol district, Fylaktou said: "We are now in the fourth year of the Pitsilia Development Plan which aims at fully exploiting the area's natural resources through the construction of various irrigation projects such as water storage cisterns, improvement of irrigation systems, and other projects for agricultural development. It is estimated that the whole plan will be completed in 1982.

"Besides the plan for the development of Pitsilia, the government is also taking measures for the agricultural development of other Limassol district areas and



is planning the construction of large road projects for making easier the approach of the villages to the city. In this respect, the new Limassol-Platral road has been completed, the Kandou-Pakhsa and Krasokheria road arteries have been further improved, and the technical-economic study for greater Limassol (concerning the Limassol-Nicosia by-passing road network with an extension to Pafos) has been completed.

"Also, the 1981 development budget provides for various appropriations for the construction or improvement of various streets in several villages of the district."

#### Turkish Houses

With regard to the housing of the displaced persons in Limassol, the district governor said that several thousands of pounds have been spent for repairing ~~abandoned~~ Turkish houses in the city and the district where displaced persons have been installed. He added that until now 2,000 ~~house~~ lots have been marked and distributed and that on at least half of them houses have already been built for the settlement of refugees. He also said that new lots are being readied--150 in Polemidia, 180 in Paraxali-Kandou-Episkopi; that the Ag. Athanasios and Linopetra settlements have been completed; that by the end of 1981 the Kapsalos and Makarios (of Polemidia) settlements will be completed; and that work at the Ag. Ioannis of Limassol settlement will be continued. Fylaktou added that efforts are being exerted to find new lots for building 250 housing units and 100 small houses for retired people.

#### Water Supply

With regard to the problem of supplying water to Limassol, Fylaktou said:

"The Water Supply Council has engaged an engineer consultant for the new water distribution network which will serve the new areas of K. Polemidia and Linopetra as well as the industrial area. It is expected that the network will include the area of the Linopetra-Limassol-Paralia triangle. Also, work is being done to supply water to the whole tourist area as far as old Limassol. As concerns the price of water, a new price readjustment is under study taking into consideration the council's present outlays so that a standard price can be determined for all tourist units.

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## SHIP OWNERS ASSOCIATION PROTESTS ENVIRONMENTAL DESTRUCTION

Athens ATHENS NEWS in English 1 Mar 81 p 5

[Text]

These are excerpts from a letter sent to the Ministry of Planning, Housing and the Environment by the Greek Passenger - Ship Owners Association.

Our Association heard with considerable concern the public announcement that legal measures will be taken to remove certain Traditional Settlements from the category of those "preservable" under Government control. The general conviction is that a wide-spread destruction of the Greek environment is taking place. This change in the law will not by any means introduce a positive improvement in cultural policy. On the contrary, these measures will result in an eventual disappearance of the last remaining structural elements of Greek civilization, which constitute the foundation of our national history.

It is inconceivable that the existing immense historical and traditional structural wealth of our country should be confused with the ruins of the past, e.g. the ancient monuments of prehistoric and classical antiquity, especially since this wealth is a part and parcel of the structure of the history of Greece.

Needless to say, we fully understand the strong reac-

tion of the general public, due to the delays in the issue of building permits for houses within residential areas classified and proclaimed as preservable under Government control. Nevertheless, we do believe that the implementation of the above-mentioned decision cannot just be considered as a measure of public usefulness.

In England, France and Germany, appropriate measures are being taken to ensure protection of architectural heritage. In the Soviet Union, such protection is extended also to the ancient monuments and traditions of the Tatar era. It is only in our country that we continue to disregard tradition, without creating any worthwhile substitutes.

The effort to safeguard and preserve our traditional settlements, and by extension to automatically significantly increase their value, is in effect the only meaningful measure to be taken for the benefit of the inhabitants. The destruction of the traditional architectural character of the buildings in Argos, and the destruction of the natural environment in Samos — to mention only two ready examples — is the direct consequence of the depreciation in value of the real estate in

those once extremely beautiful islands.

A matter of such importance, with such social repercussions, is being considered without reference to the appropriate professional agencies specializing in history, archaeology and technology (TEE, IADAS, SEA), or to those concerned with tourist development in our country, such as the National Tourist Organization of Greece and its several branches. The appointment of the special Committee which will evaluate and determine the "historic value" of the traditional settlements, and consequently their future existence, is not in itself the best way of dealing with the matter. The problem is in fact much broader, and is connected with the very status of our Nation.

We therefore call on appropriate Authorities.

— To revoke officially the ministerial decision concerning the removal of certain traditional settlements from the original list of those to be preserved.

— Along with the legal protection of the environment, both natural and man-made, steps should be taken to insure a legal network intended to safeguard, without any exception, all the historic and more recent monuments

existing in the country.

— Financial assistance should be provided by the State to the private individuals who are the owners and occupiers of traditional areas and buildings, a necessary prerequisite to secure housing accommodation for these people.

It is self-understood that the safeguarding of traditional settlements cannot be attained if based on one-sided action. At the same time, the inhabitants of traditional settlements must be provided with all the material and technical means required to maintain their houses and utilize them financially, by offering accommodation to foreigners visiting Greece as tourists, or to Greek visitors. It is therefore necessary for YHOP, YPPE, the NTOG and T.A., and the other interested agencies, to set up mixed Committees whose function should be to investigate and determine the incentives to be made available to inhabitants of traditional settlements, so as to enable them to prepare a program for the preservation of their houses and surrounding areas. We request that we also be allowed to actively participate in such Committees, as we consider that our assistance in this respect could be decisive.

— The appropriate Department of the Ministry of Site-Planning, Housing and Environment should prepare, within the shortest possible time, a series of master plans covering the historical and traditional settlements of our country, with the intention of formulating a final, but scientifically documented solution to the existing problem. It is imperative that these plans should be drawn up in consultation with the relevant collective organizations

comprised of archaeologists and technicians.

During the period of preparation of these plans, all arbitrary building activity should be suspended by law. The same concerns the entire nation, and not only one Ministry. The Co-ordination Ministry, for example, should also deal with this matter in a general way.

Greece has the potential to become the summer resort for Europe, and the application of an appropriate economic policy in the Tourist and Shipping fields could solve the country's economic problem. But if we continue to indulge in the destruction of our country, by pulling down ancient buildings and erecting concrete structures in every corner of the land, it is almost certain that tourists will necessarily turn to other countries, which have not yet happened to demolish everything that is aesthetic, cultural and traditional.

It is our duty towards the coming generations not to hand over to them a despoiled Greece, considering that within one generation we destroyed the whole of Attica and many other parts of our homeland. We accordingly offer the above suggestions as a minimum contribution towards planning the preservation of the monumental treasures of our country, within the framework of a well-organized State.

We remain,

Very truly yours,

The President

The Secretary-General

A. POTAMIANOS

P. FRANGOUDAPIS

## MEASURES AGAINST POLLUTION IN ASPROPYRGOS PLANNED

Athens ELEVTHERTOTYPIA in Greek 24 Feb 81 p 7

[Article by Maria Neofotistou: "Crusade Against Pollution"]

[Text] A series of actions which are like a crusade was inaugurated on 23 February by Aspropyrgos municipality with the presence of the mayor, municipal councilors and citizens at the kernel-oil mills of Mr. Dasopoulos 1.5 kilometers from the city of 25,000 inhabitants.

There will be similar visits to other industries in the area which will have a warning nature-- that is, either the industries comply with specifications or the inhabitants of the entire Thriasian Plain will come and destroy them. "Even if the 60,000 do not come, half or less will come, at any rate, many, very many," said the mayor of Aspropyrgos, Spyros Liaskos, who is also president of the Council of Municipalities and Communities of Thriasian Plain.

He repeated the same thing a bit later to the director and owner of the kernel-oil mills who agreed that the inhabitants are right and that in ten days he will begin to take care of the matter (when the season for the kernels brought to him from the oil mills has ended).

You do everything for money and we will do everything to live, stressed the mayor, who demanded that he visit the kernel-oil mill buildings with his councilors without meeting any resistance from the owner or the men from the gendarmery who had arrived beforehand.

The buildings there are really primitive. In a sheet-metal storeroom which holds the kernels is also a belt which conveys them, an oven and furnace are in another area, the revolving dryer is in a third area, etc. The heavy and diffuse stench causes swooning.

But we cannot say that the problem is localized in this primitive factory which, in the last analysis, spreads only a stench, not chemical essences like another nearby which produces batteries; because of it, the 100 oil trees owned by land-owner Papathomopoulos have not borne fruit for five years--this year they did not give him even one kilo of oil.

As concerns the battery factory, an idle watchman told us that eight months ago the phytopathological Benaki Institute made analyses of orchard fruits and found them unsuitable "for eating"....But these fruits are being consumed.

## Commercial Summer Resort

First the polluters should leave, and then all the industries in stages, the Attiki basin, says Aspropyrgos Mayor Liaskos. Because what sense does it make for us to talk about regional industrial programs and not only for us to not inspect or restrict the industries but also to give permits for their expansion?

Recently, Liaskos informed us, an expansion of the state refineries was announced to the Aspropyrgos Municipal Council. But this effort will come up against the municipality. He told us, moreover, that a few days ago representatives of the Ministry of Regional Planning and Environment visited the municipality and asked it to agree that an area where Vardinogiannis has property be proclaimed industrial. This is being methodized with a special legislative decree which must have been signed at this moment, and despite our verbal and written protests both to Manos and Plytas. What is the meaning of the regulator when with a legislative decree they designate industrial areas a priori?

Liaskos says that Manos has already signed two decrees, one which blocks an area of 10,000 stremmas along the Stavros-Elefsis avenue which is being laid out and the other with the A and B zone which prohibits buildings being constructed on the Thriasian Plain--storage areas, etc.

Our own proposal was for the Thriasian Plain to become a commercial summer resort, not a coffin, Liaskos stresses.

We note that to the Thriasian Plain belong the municipalities of Aspropyrgos, Elefsis, and Mandra and the community of Magoula--a total population of 60,000. There are 21 problematic industries, nine of which are in Aspropyrgos. The so-called Thriasian Council is occupied chiefly with pollution and with the general hospital which is under construction.

## Gulf of Evvoia

"An expansion of the industrial zone and construction of a harbor is being prepared for Vathy, Avlis, at the northern end of the Gulf of Evvoia with the result that the last clean sea area in Attiki-Voiotia will be destroyed." This is charged by the provisional committee for the salvation of the southern Gulf of Evvoia in its communique which maintains:

"Since the issue of survival is being broached for us, but also all of Attiki-Voiotia, we inform the authorities that we will not accept new Drapetsonas and Elefsises. We call on them to become aware of the magnitude of the destruction they are preparing and to orient their enterprising plans to other areas harmless to the public health and more economical than the one and one-half billion which they will spend beyond expropriations."



# SALONICA AIR POLLUTION PROBLEMS WORSEN

Athens TA NEA in Greek 12 Feb 81 pp 3, 15

[Article by K. Khardevellias]

[Text] Salonica--A toxic-cloud scare has been hovering over Salonica in recent days, and the alarm has been sounded to the responsible government services in a call to find out about and measure this phenomenon.

Yesterday and today, groups of scientists from the University of Salonica and the Environmental Protection Committee went to Diavata to investigate a thick cloud layer which had covered this area and had caused panic among the residents. At the same time, preparations were made to immediately implement a plan for suspending operations at many industrial plants around Salonica, which are the chief source of the city's pollution.

The initial findings of the scientists are that this cloud is the result of meteorological phenomena, and that it is not the notorious smog.

But the pessimistic forecasts made by Professors Edipidis, Vasilikiotis, and Stavropoulos of Aristoteleion University reveal that Salonica is immediately exposed to the danger of such smog, given that:

1. At the Northern Greece Center for Thoracic Diseases (under the direction of Prof K. Stavropoulos), complications from bronchial and cardiac diseases have appeared again and again recently--a phenomenon which Mr Stavropoulos attributes to the formation of smog clouds in Salonica.
2. Despite the persevering advice and recommendations by the Environmental Committee and the university professors against creating a second industrial zone in the eastern sections of the city, factories are appearing here one after another, with the result that the city is being trapped between two hotbeds of pollution.

## Lack of Planning

On this issue, the statements by Theodoros Edipidis, professor of health at the Salonica Medical School and deputy chairman of the Supreme Health Council, are characteristic: "Unfortunately, everything is being done without planning, and

the authorities are not listening to our advice and warnings. The eastern part of the city should remain exposed to the winds, so that the atmosphere can be purified and fresh air can come into the city. But unfortunately, many industries have begun operating in this area. At the point we have reached in Salonica, we should be razing factories, not building new ones with such a lack of planning."

3. It was revealed that following confidential reports from the Environmental Committee, in the last few months the responsible government services have given orders at least five times for work to be suspended for a few hours at many industrial outfits in the western portion of the city. Because the cloud of smog had grown to menacing proportions.

Yesterday's mobilization of the government services was initiated after repeated appeals by the residents of Diavata, who complained that they were being suffocated by a fog mass. In fact, by midday this "cloud" had spread to downtown Salonica as well. Following the mobilization of the authorities and the measurements which they made at Diavata in the evening, the Environmental Protection Council of the Ministry of Northern Greece issued an announcement which stresses, among other things, that:

This "cloud" was caused by a heavy radiation fog produced by a cloudless sky during the night, which cooled down the air layers situated near the ground. This phenomenon, common during the present season in the Salonica area, is created during the night hours and lasts usually until noon.

At the same time, the health laboratory of the medical school at the University of Salonica issued an announcement to the same effect, in which it is stressed that the measurements revealed that the cloud in question was ordinary fog which is commonly seen, and not a cloud of smoke soot due to activity of the nearby factories. This announcement is signed by Prof Edipidis.

The visiting specialist lecturer, Vl. Angouridakis--who was in the scientific group which went to Diavata yesterday--stated to TA NEA shortly after his return: "In fact, the cloud which we encountered was not smog. But Salonica does have a problem of atmospheric pollution. One of our allies in keeping the city clear is the "bardar" (north wind) which frequently blows into the city and purifies the atmosphere.

"But with the unplanned construction of apartment buildings and the creation of a second industrial zone in the eastern sections of this second capital, this city will be caged within two hotbeds of pollution, and at the same time the air will not be able to circulate freely within the city and drive away the toxic cloud from the industries.

"What is deplorable is that an upward trend in conditions causing the polluting of Salonica is being seen, a fact which is leading to many uneasy concerns: the future of this city."

Station Not Operative

And while all these things are going on, which put the life and health of 1 million residents of Salonica in immediate danger, Prof Edipidis reveals that

"up to now, the only station for measuring atmospheric pollution, on Tsimiski Street, has not been operating because of the death of the visiting specialist lecturer Vlachos--who had headed the station--and the dissolution of the relevant group of scientists. Now, two such stations are ready to open, at Neon Kordelion and at Panepistimoupolis. Before we could say that we are able to have certain substantive results in measuring the pollution, the city should have five such stations. But they do not give us any money," concluded Prof Edipidis.

Finally, G. Vasilikiotis, professor of analytical chemistry at the University of Salonica, stated to TA NEA that he did not rule out the possibility of Salonica having the same problems as Athens from such clouds in the future--although he was not able to fix precisely the time when this will happen. "At the present, the city is being strangled between two industrial areas, and for this reason it is spreading towards the highlands instead of following an eastward direction. From studies by the health laboratory, we see that the range of pollution levels in the city's atmosphere is already worrisome. This is attributable to the unsymmetrical growth of Salonica as well as to the bardar, which blows for only brief periods at a time. But when the city has been trapped from the east and the west by the factories, then the problem will become very acute and dangerous."

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FRENCH POLLUTION OF RHINE PROTESTED AT STRASBOURG

Paris LE MONDE in French 22-23 Feb 81 p 12

[Article by Jean-Claude Philip]

[Text] The Dutch have had their fill of drinking too salty water. Tired of waiting for the results of international meetings, a dozen Dutch institutions have filed a court action in Strasbourg to protest against the dumping of saline effluents into the Rhine by the Alsace Potash Mines.

The last international conference, held in The Hague on 26 January, reported in July on the conclusions of new studies (LE MONDE, 28 January). By granting an appreciable grace period a month ago to Minister of Environment Michel d'Ornano (in 1979 the French government abandoned the idea of having parliament ratify the 1976 international convention which explicitly provides for the salt to be injected into the Alsatian subsoil), the Dutch government demonstrated a calmness which apparently is not shared by the services directly concerned with the purity of the Rhine's water.

Strasbourg--"We have just filed an appeal with the administrative court of Strasbourg against the new dumping permit issued on 22 December 1980 by the prefect to the Alsace State Potash Mines (MDPA). We do not wish to take action against France nor to interfere with its internal affairs; however, we wish to defend our interests." This statement was made by Mr Van Der Veen, director of the Amsterdam water distribution service, during a press conference held on Wednesday, 18 February, in Strasbourg.

On that occasion, the Dutch delegation expressed its great dissatisfaction with "French inertia": "For 20 years, the Netherlands has been demanding an end to the dumping of chloride wastes into the Rhine, the principal source of water and life for 14 million Dutch. There have been 20 years of deliberations in the International Commission of the Rhine. In vain."

That is why 10 Dutch complainants, ranging from the municipality of Amsterdam to the Dutch Association for Water Distribution, have filed a suit against the MDPA.

For them, it is necessary to reduce the amount of chlorides dumped into the waters of the river by at least one-half, so as to decrease the excessive percentage of salt in the Rhine. Van Der Veen is also amazed by the fact that "the French government ratifies agreements such as The Hague accord, which stipulates the reduction by one-half of the percentage of chloride ions in the Rhine and, therefore, the dumping of salt, and does not respect them. During this time, the Dutch have observed that their bulb crops have been deteriorating, that their drinking water is threatened, and that the French government has turned a deaf ear."

The seriousness of the problem is better understood if one realizes that three-quarters of Netherland's territory is located in the Rhine basin and that the western and northern parts of the country are below sea level. The river supplies three-quarters of the "sweet" water, including rainfall, which the country receives, and the excess of salt cannot be entirely eliminated. Although the Alsace mines are the principal target, it is not that their salt is more harmful than that of other discharges but that the mines are by far the biggest producers of residual salt in the Rhine basin. "The least we can say is that France has not kept its promises. At The Hague, it was decided that the salt would be stockpiled. Then France changed its mind and decided on injection into deep underground strata.\* But nothing is being done," added the speaker.

If their suit is rejected, the complainants have decided to take it before the International Court of Justice. In fact, according to a treaty with France signed in March 1928 (art 2), the legal right to have recourse to this form of suit exists. Mr d'Oliveira, professor of private international law at Amsterdam University, has commented: "Recently, a publicity campaign in France asked the French to keep their country clean. The exact slogan was: 'France is not a garbage can!' We subscribe wholeheartedly to that text. But we would like to complement it with the principle that downstream countries should not become France's garbage can."

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\*A survey of 600 Alsations directly involved was conducted by SOFRES [French Opinion Polling Company] at the request of the Dutch Rhine Water Services Commission (RIWA). According to the survey, 28 percent of the persons polled are opposed to the injection of residual salts into Alsatian subsoil, and 49 percent have no objection to this plan.

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